

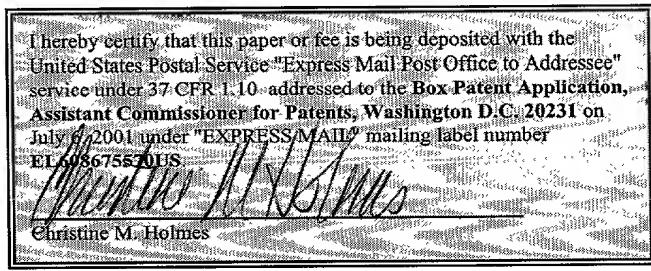
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of: David Joseph Foster and Anna Jane Harris

Filed: Concurrently Herewith

For: SCREEN PRINTING STENCIL PRODUCTION

Box Patent Application
Assistant Commissioner for Patents
Washington DC 20231



PRELIMINARY AMENDMENT

Sir:

Prior to examination, Applicant wishes to amend the subject application as follows:

In the Claims:

Please delete claims 1-33 before adding claims 35-110 as follows:

1 --35. A method of producing a screen-printing stencil having open areas and blocked
2 areas for respectively passage and blocking of a printing medium, the method comprising:
3 providing a receptor element comprising an image-receiving layer capable of receiving
4 a first chemical agent in areas corresponding to the blocked areas of the stencil to be
5 produced;
6 applying the first chemical agent to the image-receiving layer of the receptor element in
7 the said corresponding areas;
8 applying a second, stencil-forming chemical agent to a screen printing screen,
9 bringing the image-receiving layer of the receptor element into contact with the stencil-
10 forming agent, to allow the first and second chemical agents to react to produce on the screen
11 a stencil-forming layer having areas of lower solubility corresponding to the said blocked
12 areas and areas of higher solubility in areas corresponding to the open stencil areas;
13 removing any remaining unreacted part of the receptor element; and

washing away the second chemical agent in the higher solubility areas, thereby to produce the screen-printing stencil.

36. A method according to claim 35, wherein the first chemical agent is produced *in situ* by reaction between two or more precursor materials, separately applied to the image-receiving layer, prior to contact with the stencil forming agent, at least one of which is applied in the said areas corresponding to the blocked areas of the stencil to be produced.

1 37. A method according to claim 35, wherein the image-receiving layer of the
2 receptor element reacts with the first chemical agent to produce lower solubility areas
3 corresponding to the said blocked areas and excess of the first chemical agent remains in said
4 areas to react with the second chemical agent upon contact between the image-receiving layer
5 and the stencil-forming agent, whereby the respective lower solubility areas of the image-
6 receiving layer and of the stencil-forming layer combine with one another and, after the
7 higher solubility areas are washed away, remain to form the blocked areas of the screen-
8 printing stencil.

1 38. A method according to claim 35, wherein the image-receiving layer comprises at
2 least one polymers selected from the group consisting of methyl hydroxy propyl cellulose,
3 carboxymethyl cellulose, polyvinylpyrrolidone and polyacrylic acids.

1 39. A method according to claim 35, wherein the image-receiving layer comprises
2 paper.

1 40. A method according to claim 38, wherein the polymer(s) is/are present in the
2 image-receiving layer in a total amount of 5 to 100 wt % of the image-receiving layer.

1 41. A method according to claim 40, wherein the image-receiving layer contains at
2 least one material selected from the group consisting of fillers, binders and plasticisers.

1 42. A method according to claim 37, wherein the image-receiving layer comprises one
2 or more of the polymers selected from the group consisting of polyvinylalcohol and its
3 derivatives; gelatin and its derivatives; carboxylated polymers capable of becoming water
4 soluble on addition of alkali; water-soluble cellulose derivatives; sulphonated polymers;
5 polyacrylamides; epoxy resins; and amino resins.

1 43. A method according to claim 42, wherein the image-receiving layer comprises, as
2 a said carboxylated polymer, a carboxylated acrylic polymer.

1 44. A method according to claim 42, wherein the image-receiving layer comprises, as
2 a said carboxylated polymer, an ethylene-acrylic acid copolymer.

1 45. A method according to claim 42, wherein the image-receiving layer comprises, as
2 a said carboxylated polymer, a styrene-acrylic acid copolymer.

1 46. A method according to claim 42, wherein the image-receiving layer comprises, as
2 a water-soluble cellulose derivative, starch.

1 47. A method according to claim 42, wherein the image-receiving layer comprises, as
2 a water-soluble cellulose derivative, hydroxypropyl cellulose.

1 48. A method according to claim 42, wherein the image-receiving layer comprises, as
2 an amino resin, a urea-formaldehyde resin.

1 49. A method according to claim 42, wherein the image-receiving layer comprises, as
2 an amino resin, a melamine-formaldehyde resin.

1 50. A method according to claim 42, wherein the image-receiving layer comprises
2 polyvinyl alcohol with a degree of hydrolysis of from 20 to 99.9 mole %.

1 51. A method according to claim 42, wherein the image-receiving layer comprises
2 polyvinyl alcohol with a degree of polymerisation of from 100 to 3500 mole %.

1 52. A method of claim 35 wherein the receptor element includes a support base.

1 53. A method according to claim 52, wherein the support base is from 10 to 200 μm in
2 thickness.

1 54. A method according to claim 53, wherein the support base comprises at least one
2 material selected from the group consisting of polyethylene terephthalate, polyethylene,
3 polycarbonate, polyvinyl chloride, polystyrene and coated paper.

1 55. A method according to claim 48, wherein the image-receiving layer has a
2 thickness of from 0.1 to 50 μm .

1 56. A method according to claim 35, wherein the image-receiving layer has a
2 thickness of from 6 to 250 μm .

1 57. A method of claim 35, wherein the second chemical agent comprises one or more
2 of the polymers selected from the group consisting of polyvinylalcohol and its derivatives;
3 gelatin and its derivatives; carboxylated polymers capable of becoming water soluble on
4 addition of alkali; water-soluble cellulose derivatives; sulphonated polymers;
5 polyacrylamides; epoxy resins; and amino resins.

1 58. A method according to claim 57, wherein the second chemical agent comprises, as
2 a said carboxylated polymer, a carboxylated acrylic polymer.

1 59. A method according to claim 57, wherein the second chemical agent comprises, as
2 a said carboxylated polymer, an ethylene acrylic acid copolymer.

1 60. A method according to claim 57, wherein the second chemical agent comprises, as
2 a said carboxylated polymer, a styrene-acrylic acid copolymer.

1 61. A method according to claim 57, wherein the second chemical agent comprises, as
2 a water-soluble cellulose derivative, starch.

1 62. A method according to claim 57, wherein the second chemical agent comprises, as
2 a water-soluble cellulose derivative, hydroxypropyl cellulose.

1 63. A method according to claim 57, wherein the second chemical agent comprises, as
2 an amino resin, a urea-formaldehyde resin.

1 64. A method according to claim 57, wherein the second chemical agent comprises, as
2 an amino resin, a melamine-formaldehyde resin.

1 65. A method according to claim 35, wherein the active component(s) of the first
2 chemical agent comprises at least one member of the group consisting of boron salts; boric
3 acid; aldehydes; isocyanates; isocyanate derivatives; carbodiimides; carbodiimide derivatives;
4 transition metal compounds; transition metal complexes; aziridine; aziridine derivatives;
5 amines; multifunctional silane compounds; N-methylol compounds; and active vinyl
6 compounds.

1 66. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises one or more Group I or Group II metal borates.

1 67. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises formaldehyde.

1 68. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises a dialdehyde.

1 69. A method according to claim 68, wherein the dialdehyde is glyoxal.

1 70. A method according to claim 68, wherein the dialdehyde is glutaraldehyde.

1 71. A method according to claim 68, wherein the dialdehyde is activated by treatment
2 with mineral acid.

1 72. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises toluenediisocyanate.

1 73. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises 1,3-dicyclohexylcarbodiimide.

1 74. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises pentahydroxy (tetradecanoate) dichromium.

1 75. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises pentahydroxy (tetradecanoate) dichromium derivative.

1 76. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises silicon tetraacetate.

1 77. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises dimethylolurea.

1 78. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises methyloldimethylhydantoin.

1 79. A method according to claim 65, wherein the active component(s) of the first
2 chemical agent comprises 1, 3, 5-triacyloyl-hexahydro-s-triazine.

1 80. A method according to claim 35, wherein the active component(s) of the first
2 chemical agent constitutes from 0.5 to 100 wt.% of the first chemical agent.

1 81. A method according to claim 36, wherein the first chemical agent precursor
2 applied in the areas corresponding to the blocked areas of the stencil to be produced
3 comprises a reactive dialdehyde and a further first chemical agent precursor is a dilute acid.

1 82. A method according to claim 81, wherein the reactive dialdehyde is water-soluble.

1 83. A method according to claim 82, wherein the dialdehyde is glyoxal.

1 84. A method according to claim 82, wherein the dialdehyde is glutaraldehyde.

1 85. A method according to claim 81, wherein the dilute acid is an acid which lowers
2 the pH to 4 or less when mixed with the dialdehyde.

1 86. A method according to claim 85, wherein the acid is hydrochloric acid.

1 87. A method according to claim 85, wherein the acid is citric acid.

1 88. A method according to claim 35, wherein the first chemical agent is applied
2 dropwise to the receptor element.

1 89. A method according to claim 88, wherein the dropwise application is by an ink-jet
2 printer having at least one ejection head.

1 90. A method according to claim 88, wherein the dropwise application is by an ink-jet
2 plotter having at least one ejection head.

1 91. A method according to claim 89, wherein the ink-jet printer has more than one
2 ejection head.

1 92. A method according to claim 90, wherein the ink-jet plotter has more than one
2 ejection head.

1 93. A method according to claim 35, wherein the first chemical agent is supplied to
2 the receptor element by a hand-held delivery device.

1 94. A method according to claim 35, wherein the stencil is further toughened by a
2 post-treatment using further chemicals.

1 95. A method according to claim 35, wherein the stencil is further toughened by a
2 post-treatment using actinic radiation.

1 96. A method according to claim 35, wherein the stencil is further toughened by a
2 post-treatment using heat.

1 97. A method according to claim 94, wherein the further chemicals are resident in the
2 image-receiving layer.

1 98. A method according to claim 94, wherein the further chemicals are resident in the
2 stencil-forming agent.

1 99. A method according to claim 94, wherein the further chemicals are applied image-
2 wise.

1 100. A method according to claim 94, wherein the further chemicals include an
2 aqueous base.

1 101. A method according to claim 100, wherein the base is potassium carbonate.

1 102. A method according to claim 35, including a further, reclaim step.

1 103. A method according to claim 102, wherein the first chemical agent comprises a
2 borate and the reclaim is carried out at a pH of 4 or less.

1 104. A method according to claim 35, wherein the second chemical agent is applied to
2 the screen printing screen from one side thereof after the receptor element has been applied
3 to the other side thereof with its image-receiving layer in contact with the screen, whereby the
4 image-receiving layer is brought onto contact with the second chemical agent.

1 105. A method according to any of claim 35, wherein the second chemical agent is
2 applied to the screen printing screen and the receptor element is subsequently brought into
3 contact with the screen to bring the image-receiving layer thereof into contact with the second
4 chemical agent.

1 106. A method according to claim 35, wherein any support base present is removed
2 before washing away the second chemical agent in the higher solubility areas.

1 107. A method according to claim 35, wherein any support base present is removed by
2 the washing away of the second chemical agent in the higher solubility areas.

1 108. A screen-printing stencil produced by the method of claim 35.

1 109. A method of screen printing comprising the steps of:
2 providing a screen-printing stencil according to claim 108,
3 placing the screen-printing stencil in contact with a substrate, and
4 passing a printing medium through the open areas of the stencil to produce printing on
5 the substrate in areas corresponding to the open areas of the stencil.

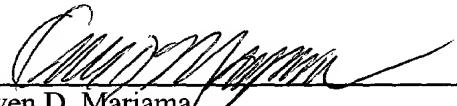
1 110. A substrate printed by the method of claim 109.

REMARKS

If the Examiner believes that contact with applicant's attorney would be advantageous toward the disposition of this case, he is herein requested to call applicant's attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-0289.

Respectfully submitted,



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